National Park Service
U.S. Department of the Interior

preserving coastal heritage

SUMMARY REPORT

April 3-4, 2014
Federal Hall National Memorial
New York City

contents

"Climate change poses an especially acute problem for managing cultural resources because they are unique and irreplaceable — once lost, they are lost forever. If moved or altered, they lose aspects of their significance and meaning. Every year, we lose irreplaceable parts of our collective cultural heritage, sometimes before we even know they exist. Therefore, the decisions we make and the priorities we set today will determine the effectiveness of National Park Service stewardship of cultural resources in the coming decades."

NPS Director Jonathan B. Jarvis, February 10, 2014, "Climate Change and Stewardship of Cultural Resources" Policy Memorandum

foreword

The National Park Service (NPS), whose primary mission is to preserve America's natural and cultural heritage, is in the process of developing a Cultural Resources Climate Change Response Strategy that brings climate science to the table with historic preservation planning. In service of this goal, and with support from the National Trust for Historic Preservation, the George Wright Society, and the National Endowment for the Arts, the NPS convened a select group of leaders in the fields of planning, architecture, landscape architecture, historic preservation, archeology, science, and park and cultural resource management on April 3-4, 2014, at Federal Hall National Memorial in New York City to participate in a planning session, entitled *Preserving Coastal Heritage*.

Using historic and culturally significant sites as case studies, session participants worked together to develop potential decision-making frameworks and discuss treatment approaches for managing vulnerable cultural resources threatened by the impacts of climate change. Such resources include historic buildings and structures, cultural landscapes, archaeological sites, museum collections, and ethnographic resources.

By collecting input from a group of diverse practitioners with real world climate change adaptation expertise, the work session helped to move the NPS one step closer to establishing a decision-making framework intended to serve as a planning tool for both the NPS and for other organizations attempting to preserve significant cultural resources in the face of a rapidly changing environment.

The recommendations and feedback that emerged over the course of the two-day work session are presented on the following pages, along with highlights from the presentations and remarks that helped to frame the task at hand. A full agenda for the event, details about the case studies used in the breakout sessions, and a summary of three webinars held prior to the convening are included among the appendices to this report.

An accompanying website contains additional information about the work session, webinars, and next steps in the NPS's ongoing *Preserving Coastal Heritage* effort.

opening remarks

Shaun Eyring, Chief of Resource Planning and Compliance for the National Park Service - Northeast Region, served as the moderator for the work session and welcomed all participants to Federal Hall National Memorial. She then introduced Joshua Laird, Commissioner, National Parks of New York Harbor (NPS), and Stephanie Toothman, Associate Director, Cultural Resources, Partnerships, and Science (NPS), and to deliver opening remarks.

Toothman framed the goals for the meeting, stating that the National Park Service wants to hear from stakeholders within the agency, from its many partners within the historic preservation community, and from planners and policy makers elsewhere who are confronting the effects of a changing climate in their respective communities and protected areas. Tapping into collective knowledge and multidisciplinary experiences is critical, Toothman acknowledged, to developing the necessary guidance for responding to these challenges and for preserving shared cultural resources.

"Our specific goal at closing tomorrow," Toothman specified, "is to have begun to identify the key questions and criteria that must be incorporated into any decision-making process, whether cultural resource specific or as part of a larger policy document, that will have direct impact on the management of cultural resources." With those questions and criteria in hand, the National Park Service plans to develop a cultural resources climate change response strategy and to publish new climate change-oriented guidelines under the Secretary of the Interior's Standards for the Treatment of Historic Properties.

The New York New Jersey metropolitan area – with its wealth of cultural and historic resources, thousands of miles of shoreline, and countless resiliency planning efforts underway – struck work session planners as a logical place to convene the group.

Joshua Laird explained why the National Parks of New York Harbor jumped at the opportunity to host: "With so many of our sites located on or near the water, sea level rise and the threats posed by climate change are a very real and ever-present concern. Events like Superstorm Sandy dominate the headlines, but we are already experiencing a gradual creep of bad weather events and higher tides that, combined with the fragility of aging infrastructure and sensitive resources, pose a very real threat to the future of the natural and cultural resources we are dedicated to preserving."

Both Toothman and Laird remarked that cultural resources have largely been overlooked among

"In other areas of the country, there might be a different mix of expertise focused on other climate change related factors—changing precipitation patterns, increased fire risks, pest and invasive species management, melting permafrost to name a few. In all cases, there are basic questions that need to be answered: what is the nature of the affected resources, what are the threats, what are the options for addressing those threats?"

Stephanie Toothman, Associate Director, Cultural Resources, Partnerships, and Science (NPS)

"We are learning here in New York City that not all natural resources can be managed the same way, and the topic of coastal resiliency may lead us to conclude that the same holds true for cultural resources."

Joshua Laird, Commissioner, National Parks of New York Harbor (NPS)

the many research and planning initiatives focused on climate adaptation. "There are a variety of simultaneous efforts in the New York region considering the question of resilience in an age of climate change," Laird noted. "These efforts are all focused on storm risk reduction to protect communities and vital infrastructure, but nothing I have seen has taken up the very particular issues of how to address sensitive historic resources."

"What we've found within the Department of the Interior, within the federal government at large, and within the many large-scale climate change research and planning efforts currently underway across the United States," Toothman underscored, "is that relatively few resources have been devoted to articulating the issues specifically affecting cultural resources – whether we're talking about buildings and structures, landscapes, collections, or traditional communities. How do we create more resilient structures and communities without destroying their historic character? How do we manage collections and the public's ability to access those collections when their locations are newly identified as vulnerable to flooding, fire, new pests, etc., because of a changing climate? How do we support traditional ways of life when the resources they depend on are disappearing? How do we manage inevitable loss for resources that are unique and can't be moved?"

These and other challenging questions set the stage for two days of presentations and breakout sessions designed to help the National Park Service craft a Cultural Resources Climate Change Response Strategy.

Following Toothman's and Laird's remarks, planning partners Anthony Veerkamp of the National Trust for Historic Preservation and Jason Schupbach of National Endowment for the Arts offered brief greetings and appreciation for the work ahead.

"It's not that often," Schupbach noted, "that you get to give serious feedback to a federal agency about their policies and programs."

Veerkamp framed the opportunity even more broadly, citing the crucial role the heritage community can play in responding to climate change. "Social scientists have demonstrated that climate change skepticism is not really about climate science at all, but rather, about personal values," he explained. "By telling stories that matter to everyone, historic places have a unique capacity the bridge the chasm that has developed in public perceptions regarding climate change. This is an opportunity to communicate to the American public why we all should care."

NPS CLIMATE CHANGE CHRONOLOGY

2002
- Climate Friendly Parks Program initiated between the National Park Service (NPS) and the U.S. Environmental Protection Agency (EPA)

2007
- NPS Climate Change Response Program (CCRP) established under the Natural Resource Stewardship and Science (NRSS) Directorate

2008
- NPS Climate Change in America's National Parks webinar series established

2009
- Climate Change Response Steering Committee created as an advisory body to the CCRP and NPS leadership
- Department of the Interior Secretarial Order 3289, Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources, issued September 14, 2009

2010
- NPS Climate Change Response Strategy published September 2010

2011
- Research conducted for Badlands National Park Climate Change Vulnerability Assessment Natural Resource Report, the first integrated natural and cultural resource vulnerability assessment
- The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings published

2012
- Badlands National Park Climate Change Vulnerability Assessment Natural Resource Report published
- Applying National Park Service Management Policies in the Context of Climate Change policy memorandum issued March 6, 2012
- Green Parks Plan: Advancing Our Mission through Sustainable Operations published April 2012
- NPS Climate Change Action Plan 2012-2014 published December 4, 2012

2013
- Using Scenarios to Explore Climate Change: A Handbook for Practitioners published July 2013

2014
- Climate Change and Stewardship of Cultural Resources policy memorandum issued February 10, 2014
- NPS Preserving Coastal Heritage Work Session, April 3-4, 2014, New York City
- International Union for Conservation of Nature and Natural Resources (IUCN) World Parks Congress, November 12-19, 2014, Sydney, Australia

cultural resources and climate change: where we are now

Before breaking into smaller group discussions, session participants were introduced to the National Park Service's broader framework for climate adaptation by Marcy Rockman, Climate Change Adaptation Coordinator for Cultural Resources (NPS). NPS established Rockman's position in 2011 to serve as a link between the NPS Climate Change Response Program and the Cultural Resources, Partnerships, and Science Program.[1]

Rockman opened by presenting a timeline of key initiatives and dates that the NPS has engaged in issues of climate change adaptation, beginning in 2002 with the Climate Friendly Parks Program and increasing in pace and activity up to the present. (See "NPS Climate Change Chronology," at left.) She also provided an overview of the current size and scale of the NPS Climate Change Response Program, including twenty-two full time staff across the country.

Rockman then summarized the NPS Climate Change Response Strategy, published in September 2010.[2] The fundamental strategy is organized into four pillars of response: science, adaptation, mitigation, and communication. (See "Four Pillars," at right.) Rockman noted that while cultural resources are included in the "adaptation" category, it became clear to NPS leadership that a more expansive effort to address the full scope of climate change in relation to cultural resources – and a companion management strategy specific to cultural resources – was needed.

On February 10, 2014, NPS Director Jon Jarvis issued a Climate Change and Stewardship of Cultural Resources policy memorandum[3] to mandate precisely this companion strategy:

> *The NPS leads the Nation in the care and management of our country's cultural resources through the national park system and our programs. …Our leadership role in cultural resources now requires engaging this framework [of NPS partners] to set priorities, to share techniques for protecting significant resources, and to help guide our collective actions with respect to climate change.*

Emphasizing that the *Preserving Coastal Heritage* work session is an important step in the collaborative process of creating a Cultural Resources Response Strategy, Rockman summarized several other aspects of the policy memo and underscored the unique narrative power that cultural resources present in helping us to understand our relationship to the natural world, and how we might better adapt in the future.

FOUR PILLARS

The NPS Climate Change Response Strategy, published in September 2010, provides direction to the agency and its employees to address the impacts of climate change. It describes goals and objectives under four integrated components:

SCIENCE Conduct scientific research and vulnerability assessments necessary to support NPS adaptation, mitigation, and communication efforts. Collaborate with scientific agencies and institutions to meet the specific needs of management as it confronts the challenges of climate change. Learn from and apply the best available climate change science.

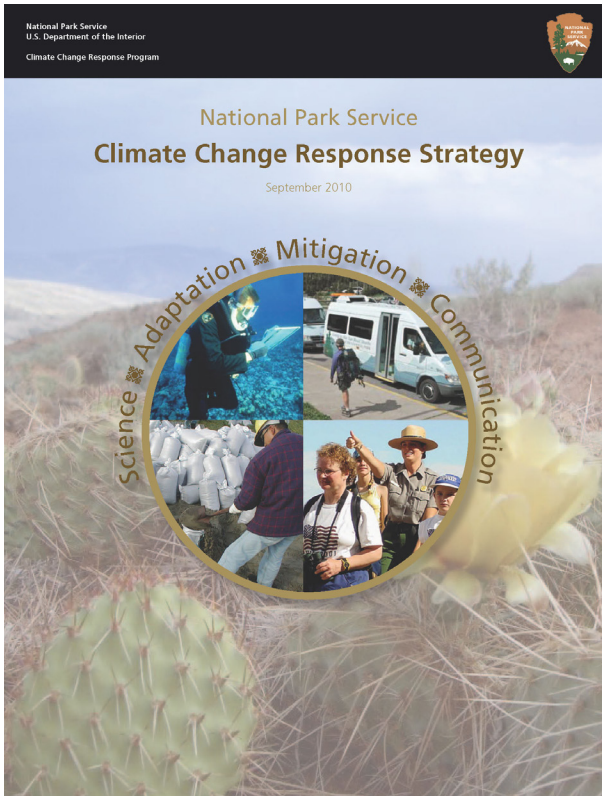
MITIGATION Reduce the carbon footprint of the NPS. Promote energy efficient practices, such as alternative transportation. Enhance carbon sequestration as one of many ecosystem services. Integrate mitigation into all business practices, planning, and the NPS culture.

ADAPTATION Develop the adaptive capacity for managing natural and cultural resources and infrastructure under a changing climate. Inventory resources at risk and conduct vulnerability assessments. Prioritize and implement actions, and monitor the results. Explore scenarios, associated risks, and possible management options. Integrate climate change impacts into facilities management.

COMMUNICATION Provide effective communication about climate change and impacts to the public. Train park staff and managers in the science of climate change and decision tools for coping with change. Lead by example.

CLIMATE CHANGE IMPACTS

IMPACT	ENVIRONMENTAL FORCES
Submersion	Sea level rise
Erosion	Sea level rise, storm surges
Inundation	Sea level rise, storm surges, flooding
Saturation	Sea level rise, rising water tables
Deterioration	Precipitation, temperature, and wind variation
Dissolution	Temperature increase (permafrost), ocean acidification
Destruction	Flooding, storms (rain/wind)
Oxidation	Increased atmospheric moisture
Depletion	Ecosystem changes due to human development
Conflagration	Fire, drought, extreme temperatures, insects
Desiccation	Temperature extremes, drought
Invasion	Invasive species, mold
Disruption	Loss of species, loss of access, looting



Rockman closed by presenting initial research findings that she and her colleagues have been developing, including a summary of all climate change impacts on cultural resources identified to date. (See "Climate Change Impacts," at left.) Rockman explained that cultural resources have always been subject to environmental forces, but climate change presents an intensification, acceleration, or new combination of those environmental forces. She noted that it's important to keep this incredible range of impacts in mind and to continue to expand the list in order to develop all necessary management practices and adaptation approaches.

References

1 http://ncptt.nps.gov/blog/climate-change-adaptation-coordinator-established-at-nps/

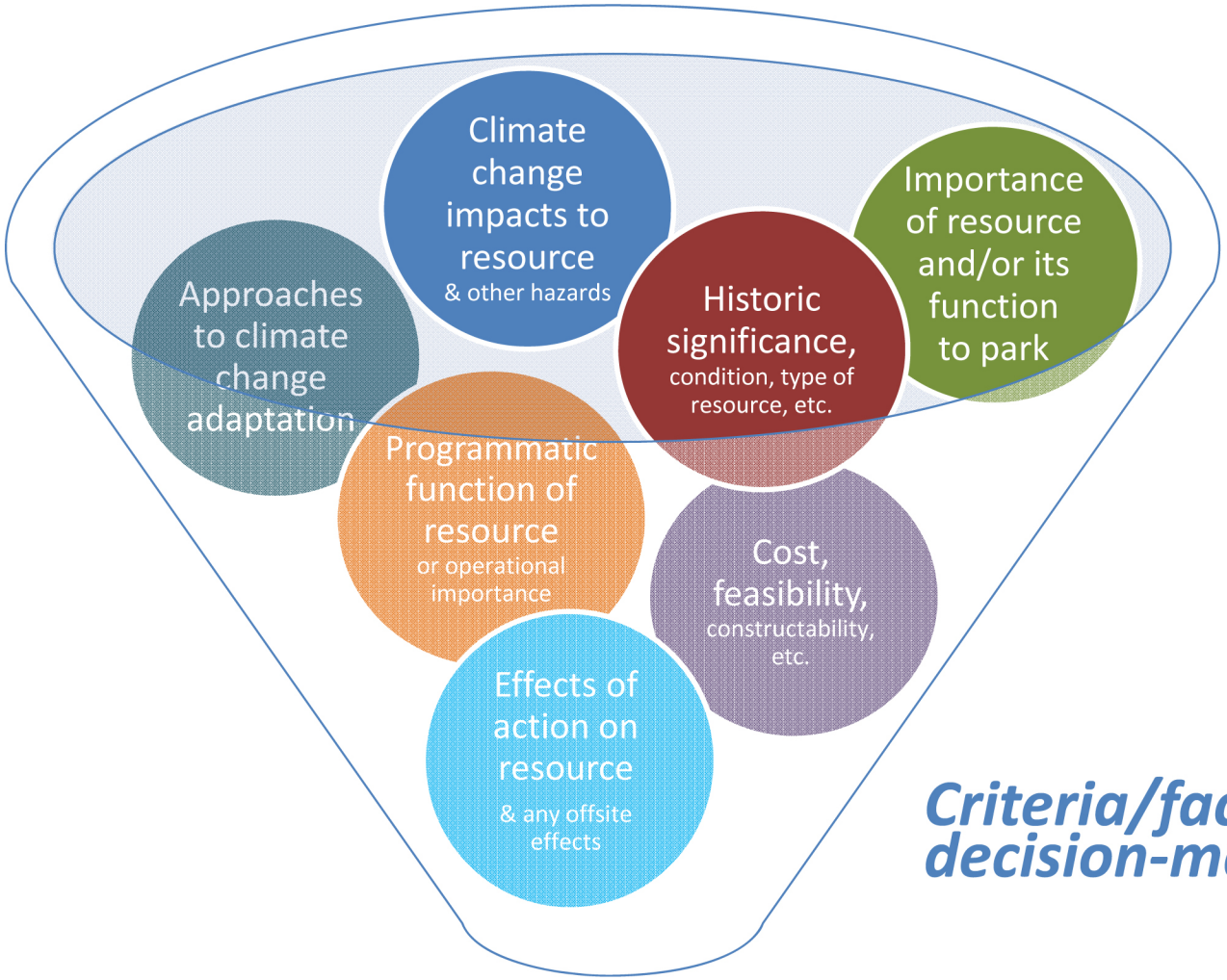
2 http://www.nature.nps.gov/climatechange/docs/NPS_CCRS.pdf

3 http://www.nps.gov/policy/PolMemos/PM-14-02.htm (Full memo included as Appendix E.)

4 http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=9cc4438c-b717-3652-d676-5011376ce474

"One of the most precious values of the national parks is their ability to teach us about ourselves and how we relate to the natural world. This important role may prove invaluable in the near future as we strive to understand and adapt to a changing climate."

NPS Director Jonathan B. Jarvis to the Senate Committee on Energy and Natural Resources Subcommittee on National Parks, October 28, 2009 [4]



Criteria/factors in decision-making

Adaptation alternative/action

criteria for decision making

To kick off the breakout sessions, Brian Goeken, Chief, Technical Preservation Services (NPS), presented a conceptual diagram (at left) as a way to illustrate the many factors that could potentially influence a park or resource manager's decision-making process when confronted with climate change-related threats. Goeken explained that the draft diagram drew from some of the factors and criteria used in different planning processes across the NPS, its development advisory boards, and Hurricane Sandy rapid review teams, and was intended to be used strictly as a starting point for the group discussions.

Each breakout group was then charged with the following questions: What is missing from these criteria? What are the criteria that are most important to consider first? What kind of information do you need to evaluate each of these criteria? How can we frame these criteria so they are helpful not just to NPS, but to state, local, or private sector resource managers?

The session prompted discussion not just about criteria, but about the broader challenges and issues that need addressing if the NPS is to establish a standard for cultural resource management in the face of climate change. The following ideas were repeated across all four breakout groups:

- Cultural resources cannot be managed in isolation; we must take natural resources and the surrounding landscape context into account.
- A national inventory and prioritization of vulnerable sites is needed in order to assess the singularity / uniqueness of sites.
- Establish a timeframe for adaptation strategies; disaster response requires an entirely different planning process from long-term prevention or adaptation.
- A resource in poor condition due to deferred maintenance or insufficient funding has a different kind of vulnerability.
- There is no natural hierarchy or sequence for the criteria; they should be assessed as more of a matrix that will vary site to site.

SESSION SUMMARY

All four groups identified the following as missing from the criteria:

• Value of resource to public / community

• Public input throughout process

• Focus on public awareness regarding climate change

• Potential for outside partners or funding

• Timeframe / urgency of threats

criteria for decision making

• Site managers should consider the "Climate Change Impacts to Resource" criteria first, with a 'yes' or 'no' answer.

• The NPS should not mandate a specific hierarchy for the remaining criteria; priorities need to be evaluated site-by-site.

• Cost tends to be the dominant factor, even when several other criteria are at play. Guidance on how to make a decision that is not primarily cost-driven is greatly needed.

• A regional inventory or documentation of threatened resources, including timeframe and level of vulnerability, is needed to help plan and set priorities.

• Establish the time frame for each criterion: distinguish between immediate crises, repeated threats, and long-term loss.

• "Programmatic Function of Resource" focuses on present significance, whereas "Importance of Resources and/or its Function to the Park" focuses on future significance.

• External opportunities are missing, such as opportunities for interpretation, education, or new partners.

"We can't save everything; we have to set priorities. We live in a time when things are going to change."

Dan Scheidt, National Park Service

"We need to consider the trade-offs between natural and cultural priorities. What may be detrimental to a building may be positive to the natural landscape."

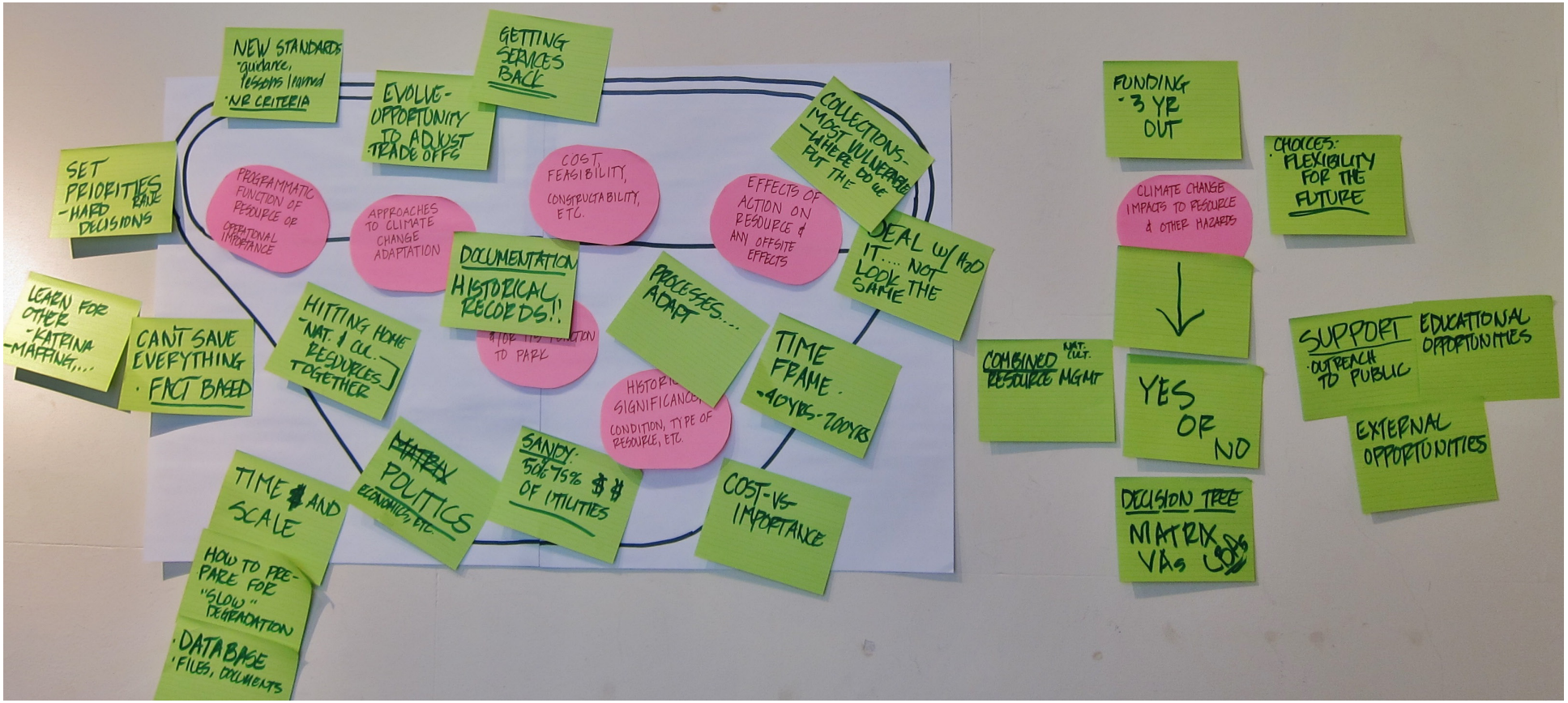
Kate John-Alder, Rutgers University, on combined resource management

"Decision-making needs to be science-based, not emotionally-based."

Randy Biallas, National Park Service

group one feedback

Facilitator: Jodie Petersen, National Park Service



criteria for decision making

group two feedback

Facilitator: Jason Schupbach, National Endowment for the Arts

"Humans have been responding to a changing climate forever, it's just that nobody called it that. Climate scientists are good at graphs and numbers, but we've shown enough graphs. We need the stories, and NPS is good at telling stories."

Rob Young, Program for the Study of Developed Shorelines, Western Carolina University

"There is a far bigger loss due to lack of maintenance than climate change. Plus, lack of maintenance just makes the risk resources face from climate change even worse. Lack of maintenance is loss by choice."

Stephen Spaulding, National Park Service

- Impossible to prioritize criteria in the abstract. The importance of these factors will change for every site or project.
- Establish a timeline for threats; urgency will impact decision-making process.
- Solicit visitor and public opinion early in the decision-making process. Civic engagement can be a tool to help educate the public about climate change, and the reality of some loss.
- Climate change is not new, but doesn't capture the public's attention the way that "extreme events" do. Alter language to communicate specific risks, resilience, and adaptation.
- Significance of resource needs to be considered both at local, scale and national scales, and expanded to include uniqueness and research potential.
- We may be losing resources because we don't yet have a national inventory that identifies current vulnerabilities and prioritizes greatest risks.
- Feasibility and maintainability of the action itself needs to be considered along with the condition of the resource.
- History of deferred maintenance on a site should not be a determining factor.
- Evaluate potential impacts to surrounding natural resources; protecting something in place in the context of a dynamic environment can have ecological consequences.
- Explore potential for outside funding or financial partnerships.

criteria for decision making

• Reorganize criteria according to four categories: Resource, Impacts, Action, Adaptive Management

• New 'Resource'-related criteria should include significance to community (both residents and visitors) and relationship to natural systems.

• New criteria tied to 'Impacts' should include severity of risk, time horizon for the impacts, and assessment of current management and conditions.

• New 'Action'-oriented criteria should include sustainability of the implemented solution, and coordination across agencies to ensure that adaptation strategies support each other.

• 'Adaptive Management' includes assessing the longevity of the solution, operational monitoring of how the resource responds, and consideration of subsequent or new strategies.

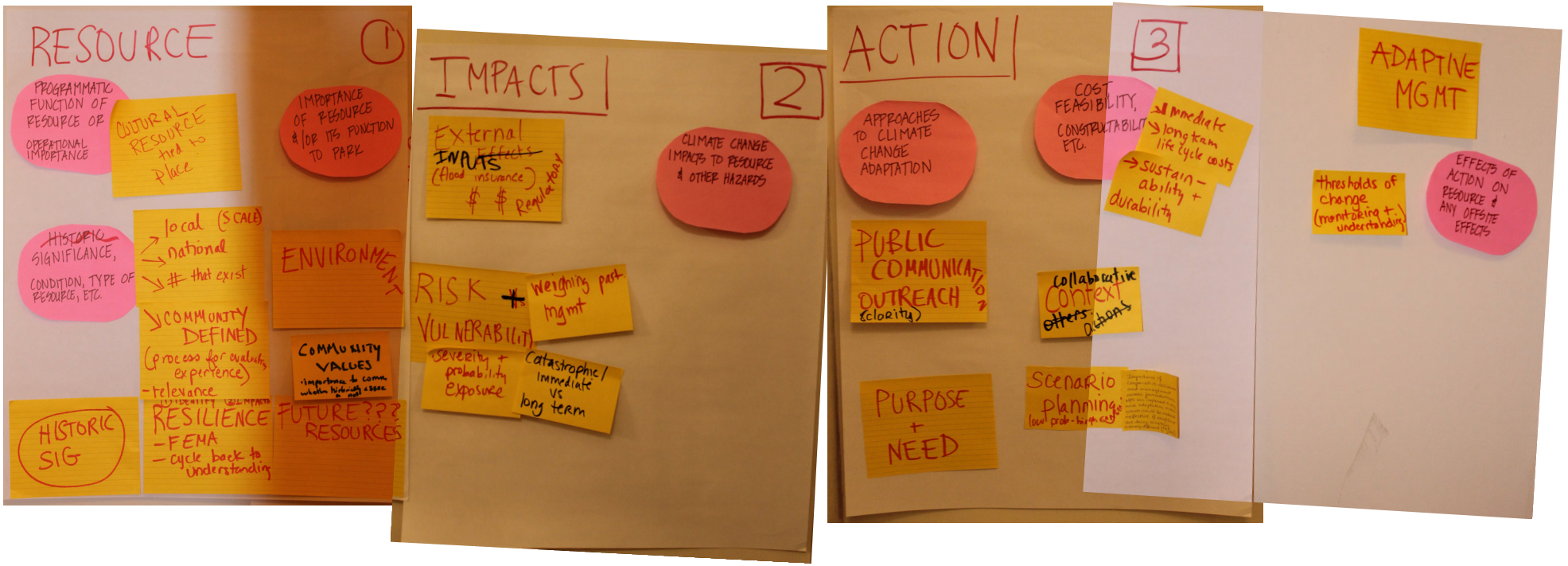
• National-scale prioritization across sites is needed to guide any site-specific decision to save, versus to let go.

"Stewardship has a huge influence over the trajectory of resources in the future. We need to be thinking about maintenance in terms of perpetuity, and how stewardship can play a role."

Susan Dolan, Cultural Landscapes Program (NPS)

group three feedback

Facilitator: Jen Hughes, National Endowment for the Arts



Susan Dolan, NPS, establishing four distinct categories of criteria.

criteria for decision making

group four feedback

Facilitator: Helen Mahan, National Park Service

"The public is becoming more engaged in the discussion of alternatives for vulnerable sites since one of the options is to document the resource and let it go."

Bob Page, National Park Service, on the importance of public involvement throughout the decision-making process

"People don't go back to a park because it's always going to be the same. The idea of a 'dynamic park' might be a positive sell to get people back into parks."

Denise Hoffman Brandt, City College of New York, on public awareness about climate change

- Significance of resource should include:
  - Condition or integrity of resource
  - Economic value, i.e., potential to generate revenue
  - Singularity of the resource within the broader NPS system
  - Degree of accessibility

- Distinguish the vulnerability of historic resource itself from the vulnerability of its infrastructure; the latter may have more adaptability.

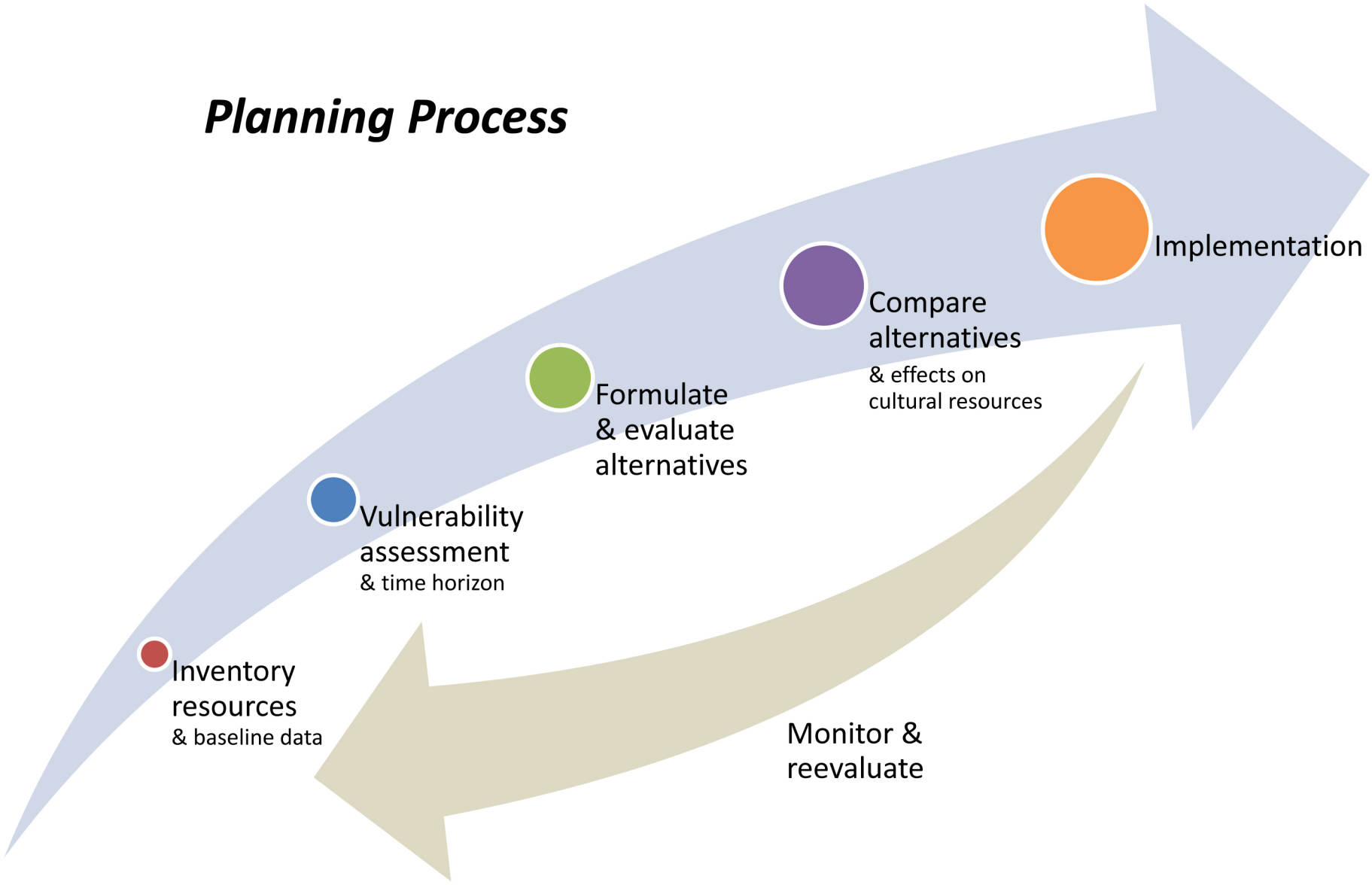
- Establish a timeframe for the risk of loss; immediate catastrophic threats require a different planning process than long-term vulnerability.

- Consider community support for the resource, and potential nonprofit or cultural partners for its management and preservation.

- Ensure public input throughout the decision-making process.

- Cultural resources cannot be managed without considering the broader environmental or landscape context.

Planning Process



SESSION SUMMARY

Five ideas were repeated consistently across all four breakout groups:

• This type of planning requires interdisciplinary expertise.

• Establish goals; groups recommended different times in the process for goal setting, but all noted that goals were missing from the process above.

• Engage the public every step of the way.

• Leverage the National Park Service's strength with regard to public education, and use the planning process as an opportunity to enhance public awareness about climate change.

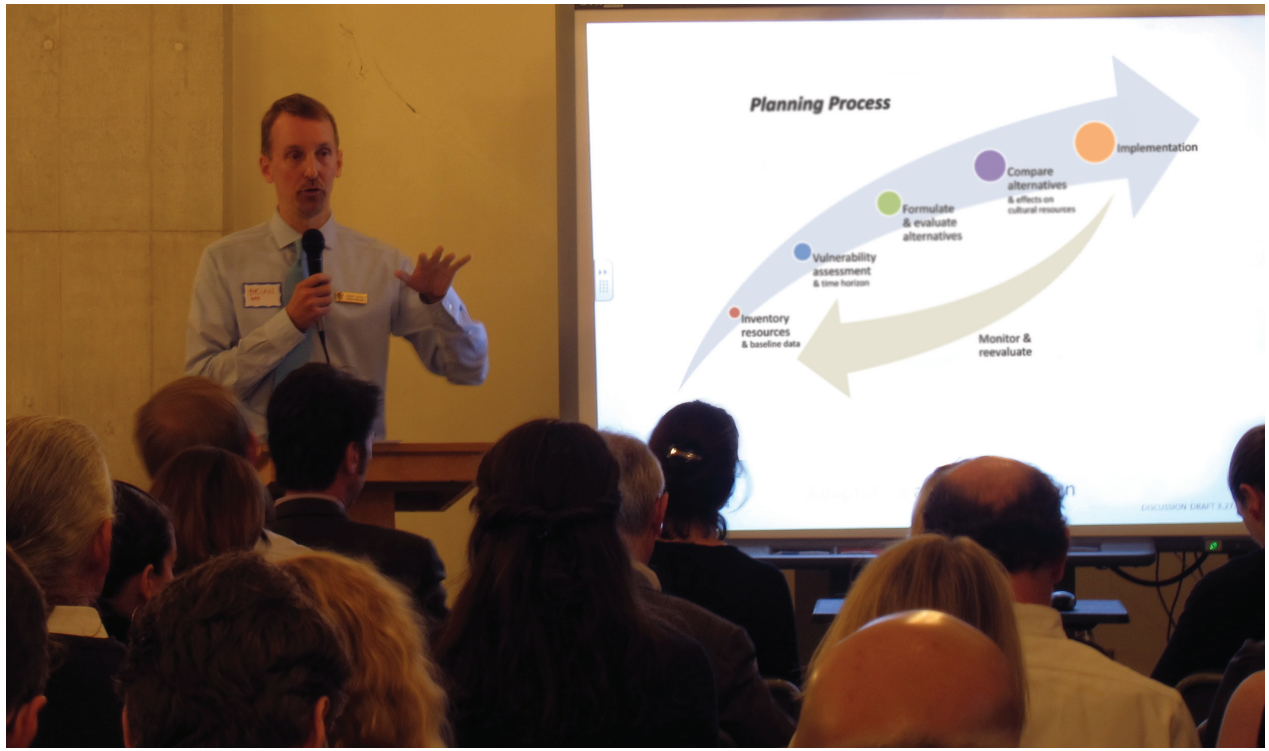
• Establish vulnerability metrics so that resources can be evaluated and compared across sites or regions.

planning process and case studies

For the second breakout session, participants were once again presented with a diagram intended to spark and structure their conversation—this time focused on the planning process and steps needed to arrive at a viable management alternative for threatened cultural resources.

In an effort to drive the discussion beyond abstract ideas about process, each group was also given a site-specific case study to use as a lens through which the planning process could be tested. The four case studies represented a range of archeological, architectural, and landscape resources currently at risk due to climate change, and each was presented by a park manager or planner with intimate knowledge of the site. [See Appendix D for details about each case study presentation.]

Though each group endeavored to generate a revised planning process 'arrow' modeled on the diagram at left, this session resulted, nonetheless, in broader, big picture feedback about the challenges of cultural resource management in the face of climate change.



planning process and case studies

Site Expert: John Hnedak, National Park Service / Case Study: Ellis Island

• Create interdisciplinary teams from the start.

• Criteria analysis and planning process should be happening in parallel, not one before the other.

• Public involvement and stakeholder input is missing from the process; both should be happening throughout.

• Provide partners and other sector cultural resource managers with a better foundational understanding of NPS processes.

• Vulnerability assessment phase must also include a risk assessment; recalibrate the dilemma of saving one resource at the expense of another.

• Establish a way to quantify resiliency in order to measure buildings against each other.

• Update collections management plans to include an emergency plan that donors, owners, and the public can agree on in advance.

• Do we need a separate planning process for adaptation?

"Fixing one problem can create another. When is it ok to take actions that may cause problems?"

Robert Melnick, University of Oregon, on the need to add a risk analysis to the vulnerability assessment phase

"People want their name on a new building, not to help fix electrical systems."

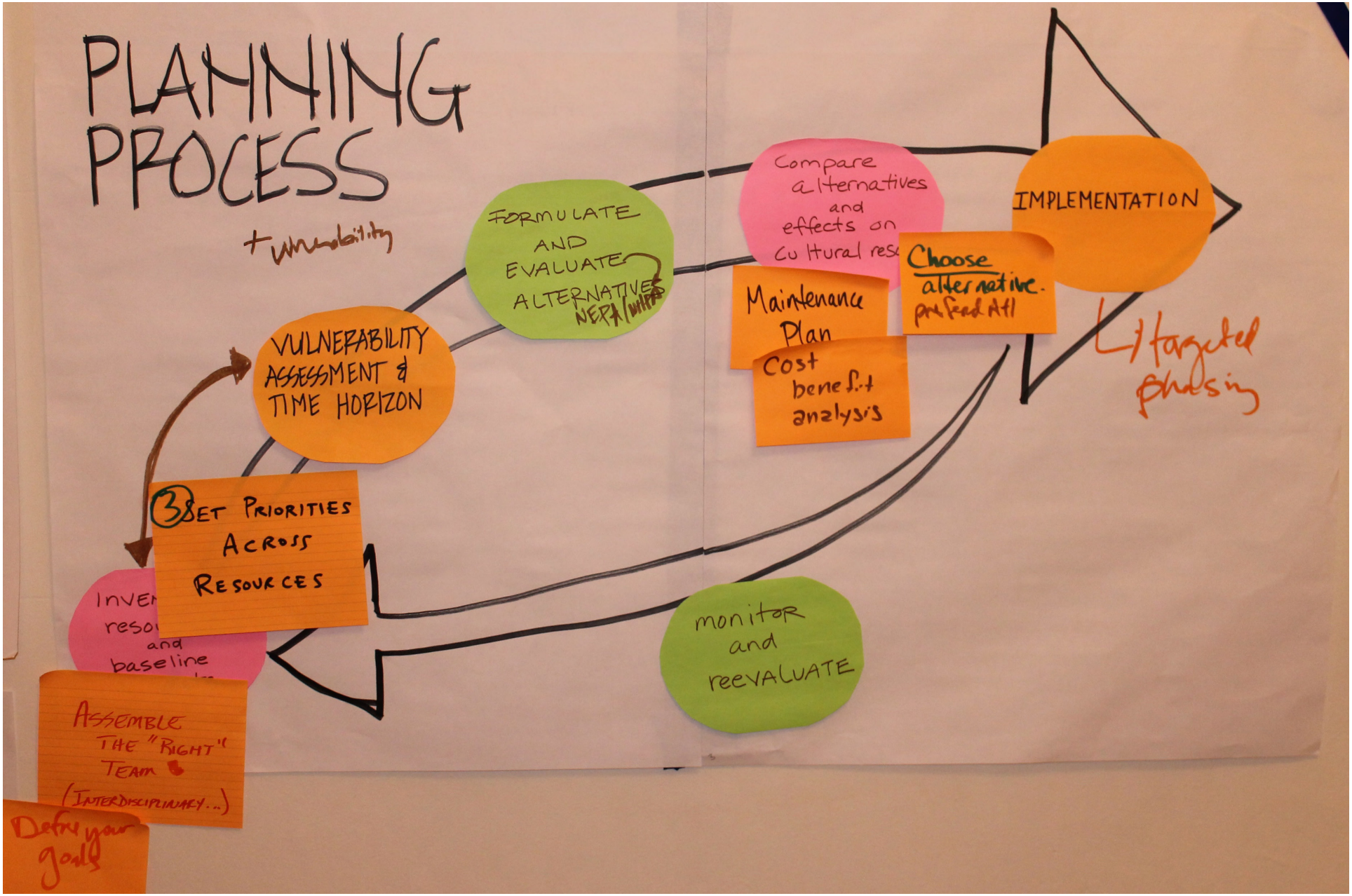
Tim Hudson, National Park Service, on deferred maintenance and the challenge of raising private-sector funding for back-of-house needs

group one feedback

Facilitator: Jodie Petersen, National Park Service

planning process and case studies

Site Expert: Randy Mason, University of Pennsylvania / Case Study: Greenwich, New Jersey



group two feedback

Facilitator: Jason Schupbach, National Park Service

• Assemble the right team in advance, including specialists.

• Critical to establish short- and long-term goals before the inventory begins, and identify where they may conflict. Revisit the goals throughout the planning process.

• 'Inventory' and 'Vulnerability Assessment' go hand in hand; allow for constant feedback loops between these two steps.

• Engage the public in each step of the process.

• The realities of funding and long-term maintenance must be considered when comparing alternatives.

• This process is specific to one site or resource; a national or regional inventory of vulnerable sites is also needed to establish priorities across competing resources.

"Cultural preservation that has been done totally separate from economic or ecological dynamics is a recipe for disaster."

Stephen Spaulding, National Park Service, on establishing goals and priorities

"Cost benefit analyses tend to omit that which is not easily quantified, such as qualitative cultural resources. What if you had the funding to protect only a portion of this village?"

Randy Mason, University of Pennsylvania, on the risks associated with a cost benefit analysis

"Structure complexity in a way that the public can understand. Embrace the many partners and interests, and have that conversation from the start."

Kate Ascher, Happold Consulting, on reaching out to partners, stakeholders, and the public

planning process and case studies

Site Expert: Marilou Ehrler, National Park Service / Case Study: Spermaceti Cove Life Saving Station

• When assessing site significance, think beyond historic significance and include the site's relationship to community and interaction with natural environment.

• "Goal Setting" is missing from the process. Add a step after inventory and vulnerability assessment that defines goals and identifies clear priorities. Goals should be framed within a specific timeline.

• Establish thresholds for monitoring and reassessment that allow change over time. Assume that new data and documentation will influence the planning process.

• Think short term and long term every step of the way. Adopt language that climate science is using: "Managing for persistence and change."

• It is critical that the NPS framework being developed is applicable to state, local, and privately managed cultural resources, not just federal parks.

• Leverage NPS's high level of interaction with the general public to provide climate change related education and guidance to local communities.

"Climate change discussions cannot be top down, they have to be bottom up and inclusive."

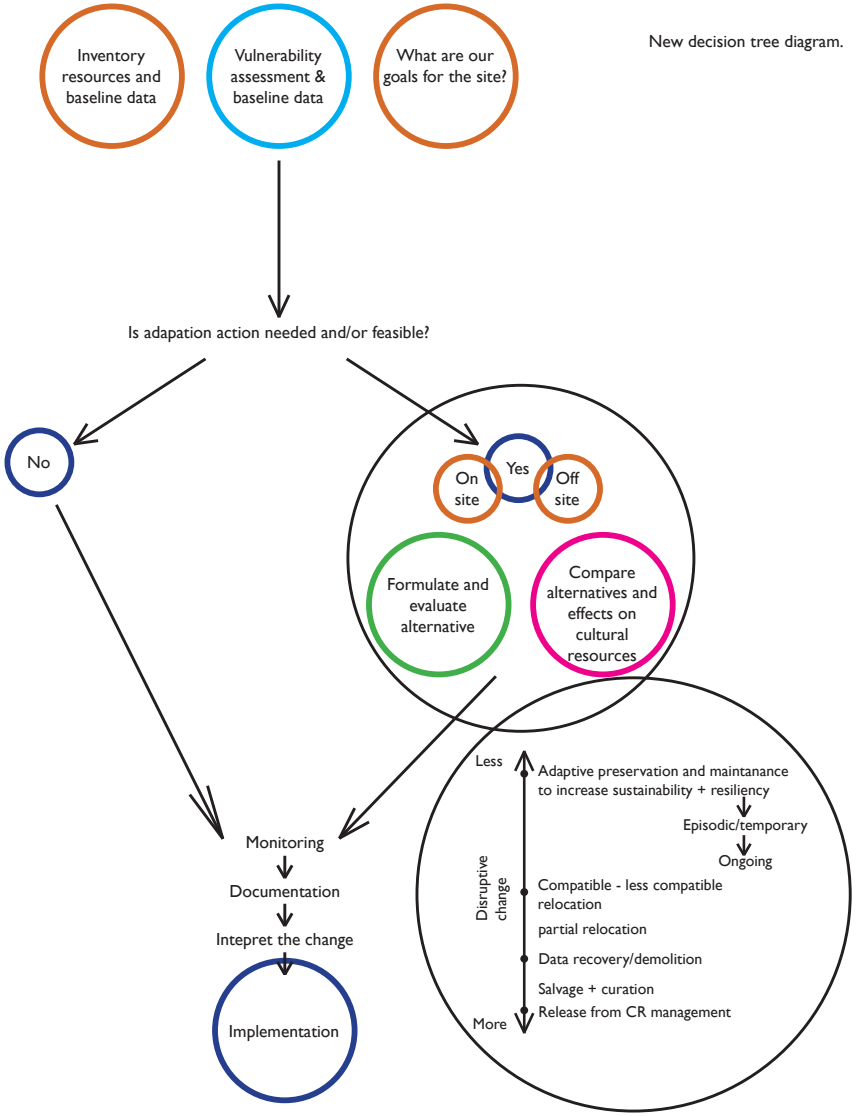
Charlene Vaughn, Advisory Council on Historic Preservation

"Long term climate change and catastrophic events similar to Hurricane Sandy have the potential to threaten our coastal resources. We should develop a strategic plan for allocating funds to address both scenarios. This strategic allocation plan should include an evaluation of where an investment in the preservation of our resources now may help reduce future catastrophic damage to our resources and the need for emergency resource allocation later."

Marilou Ehrler, National Park Service

group three feedback

Facilitator: Jen Hughes, National Park Service



New decision tree diagram.

planning process and case studies

Site Expert: David Taft, National Park Service / Case Study: Jacob Riis Park

group four feedback

Facilitator: Helen Mahan, National Park Service

"We don't have anywhere to evaluate consequences – the consequences not just for the property we're dealing with, but [for] our neighbors'. It's part of a much larger context and we simply don't have the financial resources to protect everything."

John Piltzecker, National Park Service

"Unfortunately, it's going to take another storm to make people understand that we can't rebuild the same way."

Dave Taft, National Park Service

- The criteria analysis should be an integral part of the planning process, not performed separately.
- A nonlinear matrix is more realistic than a linear sequence from one step to the next.
- More disciplines need to be involved in the decision-making process.
- Climate change should be framed not as a threat, but as an opportunity to bring an exciting new approach to longstanding issues and roadblocks.
- A holistic approach is critical; cultural and natural systems are interdependent, and NPS would benefit from managing its resources that way.
- Planning for, and responding to, a crisis requires different steps.
- We have to acknowledge change, and strengthen public awareness that everything cannot be preserved.
- Planning decisions for one site should not be made without considering impacts to the broader surrounding context.

Natural Resource Strategies for Adaptation ("The 7 R's")

RESILIENCE
Protect key ecosystem features that promote resilience

REDUCE
Reduce existing anthropogenic threats and stressors

RESTORE
Restore degraded ecosystems to maximize adaptive capacity

REFUGIA
Identify/protect refugia or important landscape connections or corridors that facilitate migration

REPRESENTATION
Maintain representation of important species, communities, or physical environments

REPLICATION
Replicate species, genotypes, and habitats to reduce extinction risk

RELOCATION
Relocate species and populations or "assist" animal migration

adaptation options

Prior to the final breakout session, participants heard again from Marcy Rockman, NPS Climate Change Adaptation Coordinator for Cultural Resources. Rockman presented a list of seven adaptation approaches (at right) that have emerged out of multiple climate change and cultural resource discussions across the National Park Service over the past two years. Far from a complete or final list, Rockman explained that the intent is to represent the full range of possible decisions that can be made for cultural resources identified as vulnerable or threatened due to climate change.

Before walking the group through each of the proposed cultural resource adaptation options in detail, Rockman summarized the adaptation strategies, known as "The 7 R's," that have been identified for natural resources. "Though we're not always speaking the same language," Rockman admitted, "I'm encouraged that there happen to be seven in both cases, and similar concepts to boot. It shows that we are thinking along the same lines." She went on to compare the ways that cultural resource approaches align with the natural resources strategies, and specified that adaptation options are only possible after climate-related threats to a resource have been identified and an active decision has been made to engage with vulnerability. "Not having done anything because of lack of time and capacity," Rockman explained, "is not the same as having reviewed vulnerability considerations and making an informed decision to take no action."

She charged the group to engage critically with the seven cultural resource adaptation options: Is there an option missing from the group? What kinds of treatments belong in each category? Are there better ways to name or describe these options so that they are more easily recognized, not only within cultural heritage communities, but other resource areas as well? Each of the seven cultural resource adaptation options are laid out in detail on the following pages, along with the feedback received from work session participants.

Rockman closed by sharing an anecdote that illustrates the powerful role that cultural resource management can play in climate change discussions. In a conversation with Jeff Mow several years ago, then Superintendent at Kenai Fjords National Park in Alaska and now Superintendent at Glacier National Park in Montana, Rockman said she had mentioned that she envied natural resource managers since "letting nature take its course" can be a viable and reasonable course of action for some natural resources. Mow replied that he actually envied cultural resource managers, since they "know how to say goodbye to things" in a way that natural resource managers have not yet learned how to do. Rockman's anecdote served to suggest that multiple sectors wrestling with climate change adaptation stand to benefit from cultural resource strategies, thereby reinforcing the need not only to capture but to communicate these strategies broadly.

Cultural Resource Strategies for Adaptation

DO NOTHING
No active intervention warranted or possible

OFFSITE ACTION
Remove or deflect environmental stresses at some remove from the resource

IMPROVE RESILIENCY
Alter or modify the resource itself to better withstand stressor or impacts

RELOCATE OR ALLOW MOVEMENT
Actively relocate some or all of the resource to a less vulnerable location

DATA RECOVERY, THEN LET GO
Comprehensively record as complete a record as possible, then allow resource to undergo full effects of stressors

RECORD, THEN LET GO
Document or otherwise preserve a record of the resource, then allow resource or portion of resource to undergo full effects of stressors

INTERPRET THE CHANGE
Interpret the effects of climate change on the resource, and actively engage visitors in that change

Fort Jefferson, Dry Tortugas National Park
Image: National Park Service

Adaptation Option 1

do nothing

What does this option mean?

- Once the need to address climate change vulnerability is recognized, making the decision to take no action is a possible decision
- Low vulnerability has been determined, therefore no active intervention is warranted
- No action possible due to technical or economic constraints
- May include monitoring or plan to revisit decision at a future point in time

Examples

- Crack monitor installed in historic structures
- Water-level sensors added to coastal building foundations
- Caution signage installed, but materials allowed to change and visitors permitted access

"Do nothing" does not accurately describe what is essentially a decision to take no adaptation action. Alternative phrases proposed include:

"Evaluate and monitor."
"Watch, monitor, and learn."
"Manage for persistence and change."
"No adaptation action needed at this time."

"The 'no action' alternative needs to be very nuanced. Knowing the predictive models for sea-level change needs to be a key component of climate change preparation, regardless of the site's immediate risk or condition. Vulnerabilities will change."

"Is the decision to 'do nothing' something you're delaying, or not doing for various reasons? Articulating WHY is critical to this option."

"It's not time to act," "We can't act," and "It's not appropriate to act" are three very different options."

"Cost should not be a reason you choose to do nothing."

"You have to make clear that there is still a price tag to 'no action.'"

"I'm somewhat uncomfortable with the phrase, 'do nothing.' We're investing money every day."

"'Do nothing' seems like a lie, you are never going to do nothing unless it is in a situation where we have done everything that we can or learned everything that we can. Is it even feasible to make this claim?"

"Are we talking about two years, ten years, or one hundred years? Identifying a timeframe is crucial to this option."

Adaptation Option 2

offsite action

"There are so many effects that often can't be anticipated. 'Offsite action' is definitely an option, but potential consequences need to be explored and better understood."

"This option implies that you cannot act alone. In the National Parks Service context, things within the borders are very different from things beyond the border. It's a clear distinction that offsite action requires partnerships, which are critical to success."

"On site and off site actions are basically the same type of option. Both will affect your site."

"The action you're taking is deflecting stress. It could be on or off site, so long as you're dealing with that stress."

"This should be called indirect action. You might try and take this kind of action if your highest priority is to take care of the resource itself."

"The power of this option is that you are affecting processes directly that will deflect stressors from the actual resource."

What does this option mean?

- Remove or deflect environmental stresses by taking action at some remove from the resource
- Enhance resiliency while minimizing changes to physical materials or setting of the resource
- Action likely to impact surrounding resources such as natural habitat or infrastructure

Examples

- Sandbags or levee plugs
- Offsite retaining wall
- Breakwater or 'living' shoreline to reduce erosion
- Upstream re-vegetation to reduce flood hazards

Jamestown Island, Colonial National Historic Park
Image: National Park Service

Casa Grande Ruins National Monument
Image: National Park Service

Adaptation Option 3

improve resiliency

What does this option mean?

- Alter or modify the resource itself to better withstand stressor or impacts
- Action intended for survival of the resource
- May (or may not) affect integrity of the resource

Examples

- Treat structural materials to better withstand increased moisture, wind or an invasive species
- Relocate building systems
- Raise building above projected flood levels
- Addition of a cap over an archeological site
- Changes in landscape plantings
- Alternative storage arrangement of museum materials on site

"This option is where the crux of our problem-solving is going to occur. This one would have the most tiers, representing levels of intervention or modification."

"'Improve on-site resiliency' is basically the definition of rehabilitation."

"Improving resilience could be one option – with on-site actions and off-site actions as alternatives."

"This option is a matter of altering or modifying the resource, versus altering or modifying the site."

"Would changing the use of the resource – to one that requires less infrastructure, for example – fall under this option?"

"We also have to allow for functional changes. The function may no longer be appropriate for many resources."

"It's dangerous to have all the implementation choices relate to only material integrity. Nothing addresses the intangible uses and meanings, such as the function of a place, the meaning of a place, or the use of the place. It may be more important, for example, to maintain a site as an agricultural landscape rather than preserving the exact configuration of the land."

"I think of this option in terms of compatible alteration. It may be just elevation of mechanical infrastructure as opposed to elevation of an entire structure."

"Historic buildings are often resilient and have survived storms with built-in flood protection already. They shouldn't be written off or altered if simply near the coast."

"We need to differentiate between resiliency and adaptation – one addresses stasis and the other addresses flux."

Adaptation Option 4

relocate or allow movement

"This option is essentially evasive action – getting out of the way of the threat."

"Allow movement should be a separate category from relocating or removing the resource."

"Relocate" is active; "Allow Movement" is passive.

"The language combining relocation and allowing movement is confusing. Relocation makes you think about a facility or infrastructure; allowing movement applies to species or natural systems."

"This option is the first time that we have species involved, and independent action outside of human management. "

"If an entire habitat needs to be relocated, there might be active replanting and assistance to the species. What gets really tricky is the issue of park boundaries."

"Do we ever NOT allow movement when it comes to species?"

"Remove barriers" might be better than "allow movement." These could be metaphorical, legal, or physical barriers."

"This is complicated when dealing with a national site; movement can compromise its eligibility."

"We're going to have to be more generous in our interpretation of integrity in terms of movement."

"Just because something has an adverse effect doesn't mean it's not the right idea or action; you just have to make the process more transparent."

"Could 'allow movement' be part of 'do nothing'?"

"It will be important to consider all legal and property rights implications to relocation of a collection."

What does this option mean?

- Actively relocate some or all of the resource to a less vulnerable location
- Allow natural movement or processes to occur
- Such shifts may move the resource outside of documented resource or park boundaries

Examples

- Move building to new location
- Relocate museum collection to another site
- Assist migration of culturally important species to new location
- Allow marsh or barrier island to migrate inland
- Allow culturally significant species to shift range

Cape Hatteras Lighthouse, Cape Hatteras National Seashore
Image: National Park Service / Mike Booher

Adaptation Option 5

data recovery, then let go

What does this option mean?

- Comprehensively record or otherwise preserve as complete a record as possible

- Allow the geographic location of the resource to undergo full effects of environmental or other forces which are likely to destroy or remove the resource

Examples

- Full excavation of an archeological site

- Exhaustive documentation of a building or structure

"The notion of 'letting go' is far too romanticized. It could mean everything from benign neglect (letting nature having its way over time), to triage in a few areas rather than the entire resource, to actively demolishing a resource."

"'Release from management' could be another way to describe letting go. This could mean controlled ruin, or turning a resource over to a community or another agency."

"It's important to recognize that there is a cost to 'letting go,' beyond the cost of data recovery."

"There are real maintenance costs involved even if you decide to 'let go.' Choosing to actively demolish could be part of a strategy."

"You can't afford to do a really intense study of every site; funds just won't allow it."

"'Benign neglect' has always been a category of management at NPS, but always as part of an approved plan. There must be a thorough review process before 'letting go' can be used as an alternative."

"Sometimes you need to destroy a resource in order to get the material recorded."

"Distinguish between controlled demolition, demolition-by-neglect, decay, and natural processes."

"We can't just suggest 'record and let go' without identifying a timeframe. Even if a resource is identified as vulnerable in the long term, twenty to thirty years of interpretation and visitation has value."

"Levels of documentation will differ from site to site. The analysis and decision needs to be relative to the rate of loss: what kind of documentation is valid over what time period?"

"Timeframe is missing from both options. We need more information with regard to the level of documentation required, and how soon we are expected to 'let go.'"

Adaptation Option 6

record, then let go

"What is the criteria that defines a sufficient level of documentation? How much documentation is required in order to justify a decision to 'let go'?"

"We should be thinking of ways to enrich the recording of resource data so that it allows for future study and investigation, not just preservation."

"'Data Recovery' says that we can further alter the site to get more data. This involves breaking the rules and digging stuff up for new interpretations. This gets lost if we combine the two options."

"I see these two options as strategically distinct. With data recovery, you are looking for an unknown. If you're simply recording, you are relying on existing documentation. One is about investigation and history and natural phenomena, and is a strategic distinction."

"As a broad category, it seems that they are both ultimately forms of investigation. But with one you're going to have a record that is not the same as the resource itself."

"I think 'data recovery' is a good phrase because it implies that all that will be left of the resource is the data, not the physical site."

"We need to think of recording in a way that's pretty robust. The resource doesn't have a life on site, but it has a life afterwards. We need to have the best possible record of data because the resource is going to be gone."

"Documentation is something that already happens throughout. Data recovery is something that corresponds to the end of documentation, when you're letting go."

"We already do documentation as a baseline activity. It shouldn't be a tool within one approach or the other; it should be used to help us get a sense of where the vulnerable resources are. If an event happens and we don't have documentation, that's a huge loss."

"All documentation should be modified to capture climate change vulnerabilities. We're not capturing this data when we're going to sites, and to the extent that we can, we should factor this into what we're doing."

What does this option mean?

- Document or otherwise preserve a record of the resource
- Allow the geographic location of the resource to undergo full effects of environmental or other forces which are likely to destroy or remove the resource
- Documentation not as exhaustive as data recovery option
- May be appropriate when exhaustive approaches are infeasible or not warranted
- Potential merit in recovering or preserving only a portion of the resource

Examples

- Archaeological site that may become inaccessible due to submergence, but is not anticipated to be fully destroyed
- Melting permafrost observed and monitored

Flood Obelisk, Red River of the North, Fargo, North Dakota
Image: U.S. Geological Survey / Kathleen Macek-Rowland

Adaptation Option 7

interpret the change

What does this option mean?

- Allow the effects of climate change to impact the resource
- Engage people with both the resource and the impacts of climate change on the resource
- May be used on its own or in combination with any of the other options

Examples

- Interpretative markers showing water line where resource was submerged due to sea-level rise or other climate change-related disaster
- Interpretative signage explaining freeze-thaw cracking in historic bricks
- Photographic series documenting changes in vegetation across a landscape

"Interpret the change should not be a separate option, it should be part of all the options."

"Documentation could be seen as a form of interpretation when a resource is going to be lost. Interpreting the change is the only means of moving forward."

"Interpretation is part of a bigger decision to 'let go.'"

"Climate change is the heritage of the future."


Roberta
Lane


ESOURCE
EPORT OUT
Larger categories

adaptation options

Though it is clear from the preceding pages that participants had plenty to say about each adaptation option, there was also a good deal of feedback that applied to the adaptation options as a whole. Some thought seven options was far too many, others identified missing options, and all groups spent substantive time exploring how the different options could work together rather than as isolated alternatives. The following comments reflect such ideas heard across all four breakout groups:

ON ORGANIZING THE OPTIONS

The options could be divided into two types: permanent action or monitoring only.

A natural resources framework advocates management for persistence and management for change – it's worth looking at our seven adaptation options in these two categories, and exploring how they apply to cultural buildings and to cultural landscapes.

One group identified three basic options: do nothing, change the context surrounding the resource, or change the cultural resources itself. Each resource may require some combination of these three.

Another group organized the options into five categories: no need for action, no action, indirect action, direct action, evasive action.

Another group came up with a spoke-and-wheel alternative that is less linear and more fluid, allowing for a greater diversity in the planning along with feedback cycles that inform the decision as circumstances evolve.

Rather than a numbered list, the options need to be set up in a grid. If you take it out of the list format, you take out that interpretation. You want things to read against each other and not in a list.

It's confusing to present these options in a linear progression; there needs to be a more intertwined feedback loop that helps account for change, be it an event or new data.

adaptation options

PROPOSED NEW OPTIONS

“Change in Use” if the resource cannot be preserved as-is.

“Actively Destroy the Resource” for safety or financial reasons.

ON ALL THE OPTIONS

Every treatment option should require documentation or recording, if only to satisfy SHPO requirements regarding alternatives. The proactive approach to management would be to always document these resources.

All seven options are looking at material change without taking into account intangible values such as function, use, and meaning. Particularly with regard to ethnographic resources, it will be critical to re-evaluate all seven options with non-material values in mind.

Recognize that for many of these options, you may take one step and then another step and another.

Several options could be identified for one site, from ‘preferred’ to ‘least preferred.’

ON ADAPTATION VS. EMERGENCY RESPONSE

There is a huge universe of cultural resources, and we need to know where to even begin. We not only need a national inventory, but also criteria for determining which sites receive adaptation attention.

Getting ahead of the inventory is critical. We have to be proactive, and we need to get the vulnerability assessment done.

We need to be more proactive in our management of assets, and shift the conversation from emergency response to adaptation prior to a crisis.

At the state level, with regard to immediate disaster emergency response, there needs to be an educational component of how to address heritage issues within 10 days of the effect. At the local level and with all our partners, boots-on-the-ground rapid response teams need to build preservation into the process somehow.

Why not create a GIS response map with cultural sites that overlay FEMA maps?

MISCELLANEOUS FEEDBACK

We need to look at both the cost of preserving the resource, and the economic value of preserving the resource. There is an important distinction between the two.

The United States can learn a lot from other countries, particularly with regard to flood control. One effort should be to gather lessons learned.

It's a matter of having nimble enough legal tools in order to take any action. We need to frame cultural resources as a public health need in terms of recovery and resilience: having places remain recognizable and usable as they get rebuilt is absolutely crucial to community rebuilding.

"Cultural resources" is too industry-speak. A grassroots campaign focused on "Protecting America's Heritage" might be more effective. We should do some market research to determine what people feel is relevant.

Overall, this needs to include a huge education component. NPS should issue guidance, preservation briefs, information on websites, and more. We can partner with HUD, the Department of Energy, and other federal agencies, working collaboratively at the same scale as sustainability.

In climate change science, mitigation is the term used to do something to prevent climate change. We need to distinguish between adaptation and mitigation.

"Climate science is changing all the time, so it's important to look at both the long-term horizon as well as the opportunities for short and mid term investments. Interim maintenance for twenty to thirty years can have tremendous value, even if a resource may disappear according to the long-term models."

Kirk Cordell, NPS National Center for Preservation Technology and Training

"Often we conflate the resource and the modern infrastructure. It's important to consider that the resource itself might be resilient whereas the modern infrastructure might not."

Tim Hudson, Hurricane Sandy Recovery Manager (NPS)

"The intangible value of cultural resources needs to be taken into account and integrated into any treatment approach. We have to be careful not to think narrowly and only about physical structures."

Randy Mason, University of Pennsylvania

"'Formulating alternatives' seems to be a big opportunity to lean on innovation and creative thinking in a positive way, rather than merely responding to climate change. We need to reimagine rather than react."

Jeff Byles, Van Alen Institute

"Maintenance IS resiliency. We need to be strong national advocates for the funding to maintain the resources that we are losing right now."

Stephen Spaulding, Historic Architecture, Conservation and Engineering Center (NPS)

"The interpretative aspects of a park can be reimagined and reinvigorated if they are linked more closely to the dynamic, natural systems that shape the park."

Denise Hoffman Brandt, City College of New York

"One strategy that seems to be missing from the treatment approaches is to turn it over to the next generation."

Cat Hawkins-Hoffman, National Climate Change Adaptation Coordinator (NPS)

"Let's remember that this sort of planning process is applicable to a whole range of natural disasters beyond sea level rise, such as earthquakes, fires, pest invasions, and more. Climate change is a wonderful didactic but sort of incidental to the real threats."

John Hnedak, Statue of Liberty National Monument and Ellis Island (NPS)

"We have been focused on a detailed adaptation process for specific sites, but before all of these steps take place there needs to be a broader methodology to review and prioritize sites for their vulnerability."

Nette Compton, Trust for Public Land

"The resources are props in a story that we are telling. So let's not just focus on the resource, but the bigger story. We may lose the physical pieces, but we can keep the stories."

Mike Eissenberg, Design and Construction Division, Denver Service Center (NPS)

key takeaways

After reviewing the breakout session outcomes as a group, participants were invited to reflect on their key takeaways from the work session as a whole, and to offer suggestions as the National Park Service moves forward in creating a Cultural Resources Climate Change Response Strategy.

Select comments are featured at left, reflecting the diverse range of perspectives and expertise present at the two day work session.

"We have to develop better methods to mourn the loss of things we cannot save. We need something more spiritual than documentation in terms of letting go, something akin to hospice care – where we recognize that we cannot fix it and instead come together in a positive ritual."

Charles McKinney, NYC Department of Parks and Recreation

"Documentation provides an opportunity to create knowledge and give afterlife to a site. Drawings may not be enough. We need to think more creatively about ways to reproduce and share information about these sites, as well as about climate change."

Michelle Berenfield, Pitzer College

"NPS is suited to be a role model for others, as the public education and interpretation aspects are really critical for communicating climate change to communities."

Deborah Kelly, Preservation New Jersey

taking the symposium forward

After soliciting key takeaways from participants, the discussion turned toward next steps and ways that the ideas and momentum generated in the breakout sessions will be carried forward. The group first heard from Robert Z. Melnick, FASLA, Professor of Landscape Architecture at the University of Oregon, who will be leading the effort to develop a draft guidance policy manual.

Funded by a grant from the National Center for Preservation Technology and Training (NCPTT), Melnick will use the raw notes and documentation from the work session as a starting point for his research and development of draft guidelines that will support site managers who are "on the ground, making decisions in real time." He explained that while there is increased attention to climate change issues within NPS, as well as national standards for inventorying and managing cultural landscapes, a systematic process does not yet exist to enable program and site managers – both within and outside NPS – to mitigate and offset such impacts to cultural resources.

Melnick stressed the importance of incorporating the latest climate science data at the local level, given that climate change impacts vary widely across environmental and geographic contexts. As such, he will structure his research around a series of eco-regions that take into account the unique relationship between cultural resources and the natural systems in which they are situated.

The primary deliverable from Melnick's research will be a manual with draft guidelines and management responses to the impacts of climate change on the cultural landscapes and resources in one eco-region. The manual will inform Marcy Rockman's ongoing work as NPS Climate Change Adaptation Coordinator for Cultural Resources, and will serve as a model for others to build on this effort as it is applicable to diverse eco-regions and cultural resources across the country. The draft manual will be made available, both in analog and digital formats, to the professional community and the general public through a wide array of distribution networks. Melnick emphasized that criticism and feedback throughout the process will be critical to the manual's success, and work session participants are invited and encouraged to reach out to Melnick directly at rzm@uoregon.edu.

Shaun Eyring informed participants that they can expect to receive the work session report directly in the coming months, and that the Preserving Coastal Heritage website will be maintained as a forum for others to post their work, additional resources, and additional follow-up webinars that are in development.

Eyring then invited several NPS partners to reflect on concurrent efforts and initiatives at their organizations that will help carry the dialogue forward:

Advisory Council for Historic Preservation (ACHP)
Druscilla Null stated that the ACHP is happy to continue providing feedback and participating in future planning and guidance development efforts, including commenting on draft documents and attending any future charettes. As the federal agency that oversees the Section 106 review process, ACHP would like to assist NPS in exploring programmatic approaches to compliance with that process for climate change related projects once NPS has finalized its decision making framework. A Programmatic Agreement or alternate procedures could be options for streamlining Section 106 review. Since several major departments and agencies are members of the ACHP, the ACHP can also encourage those federal agencies to consider using or adapting the NPS decision-making framework. In addition, the ACHP can use its outreach mechanisms to help spread the word about NPS climate change guidance among state, tribal, and local stakeholders.

National Trust for Historic Preservation (National Trust)
Anthony Veerkamp described the two-day session as having been at once sobering and hopeful, noting that such discussion among stewards and advocates is essential. "If we are not fully engaged in climate change adaptation and resiliency planning," he cautioned, "our cultural heritage will be vulnerable not only to rising tides, but also to misguided public policies that fail to adequately consider the critical role history plays in the cultural and economic wellbeing of our communities." Veerkamp commended the National Park Service for its leadership in recognizing the need for proactive planning in order to take on the defining challenge of our day, and said that the National Trust is committed to continuing to work together with its many preservation partners to develop creative solutions that assure a more secure future for our past.

NPS Climate Change Response Program (CCRP)
Cat Hawkins-Hoffman notified the group of two products underway that will inform planning for climate change adaptation associated with cultural resources. The first is a guide for climate change adaptation to be released in May 2014. Facilitated by the National Wildlife Federation, the guide entitled "Climate Smart Conservation; Putting Adaptation Principles Into Practice," is the product of an interagency/nongovernmental collaboration over the past three years. While it focuses on natural resource conservation, the guide contains a framework for practicing "climate smart" management that is equally beneficial for cultural resources. Secondly, in conjunction with the NPS Denver Service Center and the Environmental Quality Division, the NPS Climate Change Response Program is developing guidance for addressing climate change in all types of NPS planning processes, from shorter term decision documents to longer term strategic plans.

Climate change is an important influence on many park resources and a constant backdrop for all types of management plans. However, recognition of the importance of climate change does not mean that stand-alone climate change adaptation plans are required. On the contrary, addressing climate change as a component of routine planning is preferable. The draft planning guidance is expected to be complete by late 2014/early 2015.

NPS National Center for Preservation Technology and Training (NCPTT)

Kirk Cordell explained that NCPTT is focusing its efforts on creating a sustainable future for the nation's historic and prehistoric resources, and that "climate change" has been a major selection criterion for NCPTT's research and training grants this year. As NCPTT continues to promote the use of technology in preservation and to develop tools to protect cultural resources, they encounter a lot of new ideas that need to be vetted and shared with partners. The NCPTT has partnered for many years with the National Trust, most recently funding a major new study of the energy performance of historic windows by the Trust's Greenlab in Seattle. Cordell admitted that the work session generated more consensus than he expected, and a good deal of coalescing around critical issues. He acknowledged that there was also plenty of diversity in approaches to problem solving, and praised the NPS for "not just talking to ourselves, which we are sometimes guilty of doing." Citing planning tools and technology that do not yet exist, as well as policy tools and new scientific approaches, he underscored that NCPTT needs its partners and others who manage resources to help identify what's important and why in order to make sound science and policy decisions.

closing remarks

Stephanie Toothman offered brief remarks at the close of the work session, thanking conference coordinators George Wright Society for their decade of partnership with the NPS and longstanding voice in the dialogue about climate change and protected natural and cultural resource areas.

Among her own impressions from the two days of discussions, Toothman reflected on how the need to be proactive stood out: "We need to get out in front of the issues wherever we can: documenting, understanding the threats, developing options."

She also noted that the beauty of the National Historic Preservation Act is such that the NPS cannot move forward without engaging the complex partnership represented by all the work session attendees, stating "There is no way that we can move forward without all of you." She charged participants to remain vigilant about the superficial separation between natural and cultural resources, and to take the broader view of cultural resources as interdisciplinary and integral to resources as basic as air, water, and ecosystems.

Finally, Toothman closed by asserting that "capturing the stories is what it's really about." Citing recent scenario planning efforts at Joshua Tree National Park in California and Kaloko-Honokahau National Historical Park in Hawaii, Toothman argued that NPS has a responsibility to maintain and preserve the cultural histories and spiritual elements that tie people to a place even if the physical pieces are disappearing due to climate change. Though we are managing physical sites, we are fundamentally dealing with people and their enduring connections to those places.


evian

appendix a: attendees

Kate Ascher
Happold Consulting

Dave Avrin
National Park Service

Rebecca Beavers
National Park Service

Michele Berenfeld
Pitzer College

Randy Biallas
National Park Service

Ashley Braquet
University of Pennsylvania

Jeff Byles
Van Alen Institute

Nette Compton
Trust for Public Land

Kirk Cordell
National Center for Preservation Technology and Training (NPS)

Kate Daly
NYC Landmarks

Susan Dolan
National Park Service

Jenifer Eggleston
National Park Service

Marilou Ehrler
National Park Service

Mike Eissenberg
National Park Service

Shaun Eyring
National Park Service

Maryanne Gerbauckas
National Park Service

Brian Goeken
National Park Service

Dorothy Guzzo
New Jersey Historic Preservation Trust

Bonnie Halda
National Park Service

Jamie Hand
Independent Consultant

Cory Herrala
NYC Landmarks

John Hnedak
National Park Service

Denise Hoffman Brandt
City College of New York

Cat Hoffman Hawkins
National Park Service

Tim Hudson
National Park Service

Jennifer Hughes
National Endowment for the Arts

Mark Huppert
National Trust for Historic Preservation

Rachel Isacoff
University of Pennsylvania

Kate John-Alder
Rutgers University

Deborah Kelly
Preservation New Jersey

Vic Knox
National Park Service

John Krawchuck
New York City Department of Parks and Recreation

Eric N. Kuchar
New York State Historic Preservation Office

Joshua Laird
National Park Service

Fern Lan Siew
City College of New York

Roberta Lane
National Trust for Historic Preservation

Alicia Leuba
National Trust for Historic Preservation

Helen Mahan
National Park Service

Kate Marcopul
New Jersey State Historic Preservation Office

Randy Mason
University of Pennsylvania

Charles McKinney
New York City Department of Parks and Recreation

Robert Melnick
University of Oregon

Marissa Morgan
National Park Service

Larry Moss
New York State Historic Preservation Office

Jen Nersesian
National Park Service

Shawn Norton
National Park Service

Druscilla Null
Advisory Council on Historic Preservation

Andrew Opt Hof
Rutgers University

Bob Page
National Park Service

Jenny Parker
National Park Service

Jodie Petersen
National Park Service

John Piltzecker
National Park Service

Laurel Racine
National Park Service

Lizette Richardson
National Park Service

Marcy Rockman
National Park Service

Marie Salerno
National Parks of New York Harbor Conservancy

Dan Saunders
New Jersey State Historic Preservation Office

Dan Scheidt
National Park Service

Jason Schupbach
National Endowment for the Arts

Minka Sendich
National Park Service

Stephen Spaulding
National Park Service

Stephanie Toothman
National Park Service

Charlene Vaughn
Advisory Council on Historic Preservation

Anthony Veerkamp
National Trust for Historic Preservation

Rhonda Wist
Municipal Art Society

Cortney Worrall
National Parks Conservation Association

Rob Young
Program for the Study of Developed Shorelines, Western Carolina University

appendix b: work session agenda

Thursday, April 3

10:00 am	**Welcome and Symposium Overview** Shaun Eyring, National Park Service
	Symposium Goals Stephanie Toothman, National Park Service
	Brief Remarks Joshua Laird, Commissioner, National Parks of New York Harbor
	Greetings Anthony Veercamp, National Trust for Historic Preservation Jason Schupbach, National Endowment for the Arts
10:30	**Setting Context for the Discussions**
	Cultural Resources and Climate Change Response: Where We Are Now Marcy Rockman, National Park Service
	Criteria for Decision Making Brian Goeken, National Park Service
	Questions and Clarification Moderator: Jason Schupbach, National Endowment for the Arts
11:00	**Refining the Criteria** – Small Group Discussion
12:30 pm	**Lunch** Courtesy of the National Trust for Historic Preservation
1:15	**Refining the Planning Process and Case Study Discussion**
	Overview of Planning Process Chart Brian Goeken, National Park Service
	Case Study Discussion Overview Shaun Eyring, National Park Service

1:30 **Refining the Planning Process** – Small Group Discussion

4:00 **Small Group Discussion Results**
Moderator: Shaun Eyring, National Park Service

4:45 **Adjourn**

Friday, April 4

9:00 am **Overview of the Day**
Shaun Eyring, National Park Service

Taking Symposium Results Forward
Robert Melnick, University of Oregon

Revisiting the Seven Adaptation Options
Marcy Rockman, National Park Service

9:45 **Refining the Adaptation Options** – Small Group Discussion

11:15 **Bringing the Results Together**
Moderator: Jason Schupbach, National Endowment for the Arts

12:45 pm **Where Do We Go From Here?**

Next Steps
Shaun Eyring, National Park Service

Closing Remarks
Stephanie Toothman, National Park Service

1:00 **Adjourn**

appendix c: webinar series

Three online webinars were held in advance of the live work session in New York City, setting the stage for a rich conversation about the impacts of climate change on cultural resources. All webinars remain archived on the conference website; brief summaries and links to the webinars are provided below.

Thursday, February 27, 2014
Climate Science, Climate Change, and Cultural Resources
This session provides an overview of climate science and what it tells us about the present and future of climate change and the potential impacts on cultural resources. Speakers explore how coastal sites and cultural resources are affected by climate change, and what this means for future historic preservation approaches.

- **Rebecca Beavers**, Geologist and Coastal Adaptation Coordinator, National Park Service
- **Robert Melnick**, FASLA, Professor of Landscape Architecture, University of Oregon
- **Michelle Berenfeld**, PhD, Assistant Professor of Classics, Pitzer College

Thursday, March 6, 2014
Climate Adaptation, Landscape Resilience, and Cultural Resources Management
This webinar provides a detailed look at current historic preservation and natural resources management approaches and how these might intersect and inform future cultural resources management strategies.

- **Cat Hawkins-Hoffman**, National Climate Change Adaptation Coordinator, National Park Service
- **Rob Young**, PhD, Director, Program for the Study of Developed Shorelines, Western Carolina University
- **Bob Page**, FASLA, Director, Olmsted Center for Landscape Preservation, National Park Service

Thursday, March 20, 2014
Setting Priorities and Making Decisions for Preserving Coastal Heritage
This webinar looks at the challenges of balancing priorities and making decisions about how to manage coastal resources threatened by the impacts of climate change.

- **Curtis Cravens,** New York City Mayors Office of Long-term Planning and Sustainability
- **Dakota Hendon**, Urban Designer, New York City Department of City Planning
- **Helen Mahan**, Community Planner, Northeast Region, National Park Service
- **Marcy Rockman**, Climate Change Adaptation Coordinator for Cultural Resources, National Park Service

Stay tuned for additional follow-up webinars in the coming months!

appendix d: case studies

north ellis island, statue of liberty national monument

Site Expert: John Hnedak, National Park Service

location
Ellis Island #1, New York Harbor, New York / New Jersey

significance level
National, National Register listed 10/22/1976

level of integrity
Good

range of resources and resource types
Historic structures, cultural landscape, museum collections, library, archeological sites

period of significance
1892-1954

area of significance
Criterion A: Immigration history

site purpose and use
Immigration museum

important dates
1900-1938, 1984-1994

current condition
Fair

current long-term preservation goals
Rehabilitation for continued use as a immigration museum

climate change vulnerability
Rising sea level and storm surges

appendix d: case studies

greenwich, new jersey

Site Expert: Randy Mason, University of Pennsylvania

location

Greenwich, New Jersey, Cumberland County, Delaware Bay Coast

significance level, level of integrity, range of resources and resource types

Greenwich is an English colonial town dating from the 1680s, in some aspects predating Philadelphia. As an early and remarkably intact port town, it is clearly of national significance. The form of the town – along Ye Greate Street, leading away from the river landing – and many heritage buildings retain a great deal of integrity. A number of rare 18th and 19th century buildings, including houses and two Quaker meetinghouses, remain. The surrounding township generally consists of agricultural and coastal landscape contexts, and an historic African-American community related to the Underground Railroad sits just upland from historic Greenwich.

The openness of the surrounding landscape is due in part to continuing agricultural use, coastal marsh environment, and the nearby Salem nuclear power station, which opened in 1977resulted in large area of conservation lands. Greenwich Historic District listed on the State and National Registers in 1971 and 1972.

period of significance

Late 17th to early 20th century

area of significance

Early colonial settlement in continuous habitation for 300+ years

site purpose and use

A continuously inhabited village

important dates

Founded in the 1680s

current condition

Overall integrity is excellent; some individual buildings/resources have been lost over the years, but replacements have reinforced the historic pattern; population is aging; the village is threatened by typical forces affecting rural communities as well as the acute threats from coastal vulnerability.

current long-term preservation goals

Retain integrity of village as historic place and viability as a rural residential community; protect important individual architectural resources; protect historic landscape setting; confront the realities of sea-level rise and coastal-storm risk.

climate change vulnerability

Extremely vulnerable to sea-level rise due to low elevation and location near the Delaware Bay shore. Some 18th and 19th agricultural dykes have been reinforced with modern technology, others un-maintained. Some other (later, barrier-island) communities along the Delaware Bay shore have been or are in the process of being abandoned.

primary cultural resources

Original town plan and landscape context
Historic houses along Ye Greate Street
Quaker meetinghouses
Agricultural dyke systems

appendix d: case studies

spermaceti cove life-saving station

Site Expert: Marilou Ehrler, National Park Service

location

Spermaceti Cove Life Saving Station No. 2, Sandy Hook Unit, Gateway National Recreation Area, New Jersey

significance level, level of integrity, range of resources and resource types

Spermaceti Cove was among the sites where the first U.S. Life-Saving Stations were constructed in the mid-nineteenth century. The Life-Saving Station is located on the southern end of the Sandy Hook Peninsula, situated adjacent to Spermaceti Cove on the Atlantic Ocean side of the Hook. Originally constructed 800 yards from the ocean, the Life Saving Station is now approximately 150 feet from the ocean due to erosion.

As the U.S. Life-Saving Service expanded in the nineteenth century, a second station was constructed at Spermaceti Cove. The present Spermaceti Cove Life-Saving Station No. 2 is a Duluth-type station constructed in 1894 that was based on the 1893 station designed by George R. Tolman. It was one of at least twenty-eight Duluth type stations constructed for the service. The station was individually listed on the National Register as the Fort Hancock U.S. Life-Saving Station in November 1981 and has national significance. The station is located within the Fort Hancock and Sandy Hook Proving Ground National Register Historic District (April 24, 1980) and was listed in 1982 as a contributing resource in the Fort Hancock and Sandy Hook Proving Ground National Historic Landmark District. The NHL nomination acknowledges the significance of the Spermaceti Cove Life-Saving Station as one of the earliest sites of the Federally-sponsored efforts to save the lives and property of coastal shipwrecks.

Although the station has undergone numerous alterations, the building retains its historic appearance. The exterior retains the original massing and some extant historic features. The interior also retains integrity; although the first floor level has been altered, the boat room and stair hall have a high degree of integrity and alterations above the first floor have been minimal.

period of significance

Life Saving Station: 1894-1949
National Historic Landmark District: 1874-1974

important dates

1893 – date of construction
1930 – porch enclosed
1949 – decommissioned

area of significance

Criterion A: Reflecting the history of the U.S. Life Saving Service and the U.S. Coast Guard.
Criterion C: Embodying distinctive characteristics of a particular period and type of construction.

site purpose and use

Prior to Hurricane Sandy, the Life Saving Station served as a Visitor Center providing area visitors with information on Gateway National Recreation Area. It also housed exhibits on the U.S. Life Saving Service and the natural environs of Sandy Hook.

current condition

Since Hurricane Sandy, the building has been vacant and is without heat or services. During the storm, the basement and first floor flooded approximately 12-18 inches above the first floor level. Mold remediation, including removal of non-historic floor finishes and removal of baseboards to allow for ventilation of wood walls, was completed.

current long-term preservation goals

HSR recommends rehabilitation; in Gateway National Recreation Area's draft General Management Plan, Preferred Alternative, Spermaceti Cove Life Saving Station is in the Historic Zone, listed as Preserve in the banding chart.

climate change vulnerability

The building is located adjacent to the Atlantic Ocean, set within the FEMA AE 12 zone. The first floor level is below the flood level. The building is subject to rising sea levels and storm surge.

appendix d: case studies

jacob riis park

Site Expert: David Taft, National Park Service

location

Jacob Riis Park, Gateway National Recreation Area, between Jamaica Bay and the Atlantic Ocean, Breezy Point, New York

significance level

State, National Register determined eligible SHPO, 10/25/1966

level of integrity

Good

range of resources and resource types

Historic structures, cultural landscape

area of significance

Criterion A: Significance associated with public recreational development during the 1930s
Criterion B: Noted NYC journalist and social reformer Jacob Riis, and visionary Park Commissioner Robert Moses
Criterion C: Park and recreation architecture of the 1930s

site purpose and use

Recreation facility

current condition

Fair

period of significance

1931-current

important dates

1931-1932, 1936 -1937, 1992

current long-term preservation goals

Rehabilitation for continued use as a recreational facility

climate change vulnerability

Rising sea levels and storm surge

primary cultural resources

All Field Electrical Building, BP-605A;
Bathhouse - Beach Pavilion, BP-606.7;
Bathhouse - Cabana Showers, BP- BP-606,8;
Bathhouse - East Wing Pavilion,
BP-606.6; Bathhouse - Entrance Pavilion, BP-606.1;
Bathhouse -West Wing Pavilion, BP-606.2;
Bathhouse – Walkways, BP-610.6;
Boardwalk, BP-610.0;
Boiler Room, BP-603A;
East Mall Building, BP-604;
Garage, BP-601B;
Golf Course Concession, BP-603B
Mall Walkway, BP-610.4;
Park Police Stable, BP-601A;
Parking Lot, BP-611.3;
Pedestrian Subway, BP-616;
Promenade, BP-610.3;
Pump House, BP-606A;
West Mall Building, BP-803

appendix e: policy memorandum 14-02

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, N.W.
Washington, D.C. 20240

FEB 10

Policy Memorandum 14-02

To: All Employees

From: Director

Subject: Climate Change and Stewardship of Cultural Resources

This policy memorandum provides guidance and direction regarding the stewardship of cultural resources in relation to climate change. It follows my March 6, 2012, memorandum, *Applying National Park Service Management Policies in the Context of Climate Change,* which addressed the implications of climate change on the guiding principles of National Park Service (NPS) resource management. Additional guidance, in the form of a Cultural Resource Climate Change Strategy, will be forthcoming.

Background

Since my first climate change memorandum was issued in 2012, the risks posed by climate change to parks and communities across the Nation have become even more apparent. Climate science projections anticipate that the rate and intensity of climate change effects will continue to increase for the foreseeable future. Climate change poses an especially acute problem for managing cultural resources because they are unique and irreplaceable — once lost, they are lost forever. If moved or altered, they lose aspects of their significance and meaning. Every year, we lose irreplaceable parts of our collective cultural heritage, sometimes before we even know they exist. Therefore, the decisions we make and the priorities we set today will determine the effectiveness of NPS stewardship of cultural resources in the coming decades.

The NPS leads the Nation in the care and management of our country's cultural resources through the national park system and our programs. On behalf of the Secretary of the Interior, we manage preservation programs that extend to nearly every American community. The National Register of Historic Places and National Historic Landmark Programs, the Federal Historic Preservation Tax Incentives Program, Technical Preservation Services, National Heritage Areas, National Scenic and National Historic Trails, certification of local governments, and our partnerships — including collaborations through the Landscape Conservation Cooperatives, and with tribal governments, States, universities, and other Federal agencies — form a framework for historic preservation inside parks and around the country. Our leadership role in cultural resources now requires engaging this framework to set priorities, to share techniques for protecting significant resources, and to help guide our collective actions with respect to climate change.

NPS cultural resource management must keep in mind that (1) cultural resources are primary sources of data regarding human interactions with environmental change; and (2) changing climates affect the preservation and maintenance of cultural resources. The NPS will integrate these concepts into information and data gathering and analysis within each of the four components of the NPS *Climate Change Response Strategy*: science, adaptation, mitigation, and communication. The Cultural Resource Climate Change Strategy currently being prepared will provide further guidance.

Several recent documents set out approaches for the NPS to address current and future effects of climate change: *Climate Change Response Strategy* (2010), *A Call to Action* (Action Item 21: Revisit Leopold 2011), *Revisiting Leopold: Resource Stewardship in the National Parks* (2012), *Green Parks Plan* (2012), *Climate Change Action Plan* (2012), and the forthcoming Cultural Resources Challenge. The guidance included in this policy memorandum should be integrated, as applicable, into all actions stemming from those documents.

Based upon discussions across the Service, I address three essential questions with respect to NPS cultural resources and climate change: (1) what is climate change adaptation for cultural resources; (2) how should we make decisions related to cultural resources in light of climate change; and (3) how do we communicate regarding climate change science and impacts.

1. Climate Change Adaption for Cultural Resources

The focus for cultural resources adaptation in an era of climate change must be on our research and management practices. Following the Intergovernmental Panel on Climate Change and as incorporated into the NPS *Climate Change Response Strategy*, adaptation is "an adjustment in natural or human systems that moderates harm or exploits beneficial opportunities in response to change." Because cultural resources have strong ties to place, risk the loss of integrity if moved or altered, and are in large part non-living, their capacity to move or change as environments around them change is limited. Therefore, we must take a flexible approach in our management actions. Our long-standing policies and the regulations we help administer require that management decisions consider the specific characteristics and significance of each cultural resource. Climate change does not alter these requirements, but it does challenge us to manage these resources in the best possible manner given uncertainty and sometimes rapidly changing conditions.

Specific foci for adaptive research and management activities will include:

A. Integration of Natural and Cultural Resources: Modeling of climate change impacts and the collecting of environmental monitoring data should, wherever feasible, integrate the data needs of both cultural and natural resource managers. Cultural resources exist within or include parts of the natural world. A given climate variable can affect natural and cultural resources quite differently — heat stresses pikas differently than historic wooden buildings. However, both are stressed and the tracking of that trend provides critical information to both cultural and natural resource managers. Such information should be integrated into standardized reporting for both cultural and natural resources, such as *State of the Parks* reports. In turn, cultural resources also have tremendous potential to provide critical information for climate science, such

as data about past climates at local scales and the history of human impacts on the environment. We must work with our partners to tap this information more fully and use it effectively in establishing baselines, assessing change, undertaking planning efforts, and setting management goals.

B. Innovation for Emergent Threats: Effective adaptive management requires that our decision processes be nimble and flexible. Because climate change-related impacts to cultural resources can occur rapidly, often with less warning than our budgeting cycle is designed to accommodate, I encourage managers to use appropriate discretion and innovation in their actions and decision processes, including reallocating funds, where appropriate, to address emergent threats.

C. Incorporation of Cultural Resources into Sustainability Actions: Cultural resources should be important components of efforts to mitigate the effects of climate change nationwide by improving energy efficiency and reducing greenhouse gas emissions. The adaptive reuse of historic buildings and installation of energy-saving design elements, for example, can be more climate friendly than new construction. As the recently revised *Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings* make clear, rehabilitation to meet current needs often can be done while maintaining historic integrity in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Within the NPS, cultural resources are integral to full implementation of the NPS *Green Parks Plan*. I encourage managers to incorporate historic structures and cultural landscapes into their carbon reduction strategies and planning.

D. Evaluation of Siting of Museum Facilities and Collections: In light of the risks posed by climate change, we must revisit past decisions about museum facilities and collections. As part of a broader effort to update how we site and use facilities, I direct the Associate Director for Cultural Resources, Partnerships, and Science to undertake a vulnerability study of our museum facilities and collections, and develop a plan for improving stewardship of them.

2. Cultural Resources Decision-making in an Era of Climate Change

Cultural resources have long been subject to environmental forces. The risks of climate change for cultural resources lie in the alteration and recombination of these forces, which together are increasing the types and intensity of impacts on cultural resources. My memorandum of March 6, 2012, addressed the impairment prohibition of the NPS mission and charged the NPS with continuing to work to preserve resources unimpaired from in-park activities. It directed us to engage fully in cooperative conservation and civic engagement to mitigate the impacts arising from external forces. For cultural resources, this work must include the following:

A. Refocus Inventory Responsibilities: As per our responsibilities under section 110 of the National Historic Preservation Act (16 USC 470h-2), NPS policy is to identify resources, evaluate their significance and eligibility for the National Register of Historic Places, and assess any threats of impairment. Accordingly, parks should focus their resource inventory work on lands not yet investigated in those areas most vulnerable to observed and projected climate change impacts and other threats. These areas may include wilderness.

B. Integrate Resource Vulnerability and Significance: We will prioritize cultural resource funding and management actions on projects that integrate vulnerability and resource significance. The current Service-wide Comprehensive Call already prioritizes such work. As such, all identified cultural resources should be evaluated in terms of their vulnerability and significance so that management decisions are directed to resources that are both significant and most at risk.

C. Understand the Range of Climate Change Effects: Cultural resources are vulnerable to dramatic and well-publicized effects of climate change, such as sea level rise or storm surge. Evidence from across the Service is beginning to indicate they are also vulnerable to inland and other more subtle effects of climate change, such as the impacts of more freeze/thaw cycles on stone walls or more rapid wetting and drying cycles on adobe buildings. We must improve our understanding of these additional impacts, address them in our stewardship practices, and be able to communicate them to the public.

D. Consult Broadly: Consultation to inform the assessment of resource significance must engage a broad array of stakeholders. This will ensure that our actions are based upon thorough, up-to-date understandings of how and why our resources are valued by many diverse groups, including Native Americans and other traditionally associated people, visitors, and the scientific community. It is critical that we engage with all stakeholders to identify their important stories and strengthen our understanding of cultural resources and their values. The National Register of Historic Places eligibility criteria provide a sound framework for assessing significance. In addition, we may discover during consultation that the contemporary significance of our parks and resources transcends the enabling legislation for individual parks. Consultation to glean and understand the contemporary significance of cultural resources to the American people will help keep the national park system and the NPS relevant for generations to come.

E. Value Information from the Past: National Register criteria challenge us to identify and manage not only our known and honored heritage, but also to understand how cultural resources can address questions about the past. Such questions must now include how our modern climate situation has come about and how human societies have responded to climatic and environmental variability in the past. What do resilient and sustainable societies look like? The resources in our parks, including the ones we have not yet identified, have a vital role to play in answering these questions for our multiple publics. Incorporating these questions into our significance evaluations is another critical piece in maintaining NPS relevance into the future.

F. Recognize Loss: We will ensure that our management options recognize the potential for loss. Responsible stewardship requires making choices that promote resilience and taking sustainable management actions. Funding temporary repairs for resources that cannot, because of their location or fragility, be saved for the long term, demands careful thought. Managers should consider choices such as documenting some resources and allowing them to fall into ruin rather than rebuilding after major storms. Such decisions for loss cannot be made lightly nor without appropriate consultation and compliance. They must incorporate interdisciplinary research and should be coordinated on a consistent and Service-wide basis. As with many aspects of climate change adaptation, as yet there are no specific guidelines for these decisions. Guidance and tools to support them are being built in the Cultural Resource Climate Change

Strategy, other documents in preparation, and through the continued collaboration and best practices of our parks, regions, and national programs. History will judge us for the choices we make, and we will take comfort in knowing that sometimes the hard choices are also the ones that are best for our resources, our parks, and our Nation.

3. Communicating about Climate Change Science and Impacts

The NPS has taken significant strides in communicating about climate change through interpretive and educational programs in our parks and through our Service-wide programs. Cultural resources and the stories they anchor are one of the most powerful means we have to share experiences and connect changes in parks to trends across the Nation and worldwide. Impacts to cultural resources provide tangible examples of the effects of climate change at the human scale. Cultural resources offer lessons in past human successes, and failures, in adapting to environmental changes, and provide insight into the origins of the modern climatic situation. There is much to learn and share from traditional ecological knowledge and the weather- and disaster- related memories, practices, and architecture of traditional communities.

Every place has a climate story, many have more than one. Some are told in various ways by the people who have lived and worked on the land for generations. Building on the communication goals of the NPS *Climate Change Response Strategy*, each park and program should engage its staff, including facilities and maintenance staff, rangers, resource managers, scientists, and superintendent, and its surrounding communities to begin to identify and share their climate stories. It is important to do this — even when doing so is uncomfortable — so that they can spark discussion and inform choices. We must be committed to talking about climate change Service-wide, in our internal and external communications, including acknowledging the uncertainty we face as we make management decisions that will have long-term consequences for cultural resources. We will leverage the additional message about climate change into on-going stories and programs where appropriate.

Looking Forward

Climate change is one of the great challenges of the 21st century. It is remaking our world and substantially influencing how we set priorities and make management decisions. The process of adaptation will not return us to the way things have been done before, but it will assist us in making choices in the face of uncertainty and change. Cultural resources remind us of who we are and where we have come from. They offer clues on past climate variability and speak to the many different ways humans have adapted to changing environments over time, in our parks and across the country. We need their information and their inspiration.

We must be well-informed and creative in our approach to resource management given the effects of climate change. The paths climate change will take remain uncertain so we must be open to the unexpected, search out new and useful ideas, and share the innovations we develop. This cannot be a NPS-only effort, but instead will require a collaborative approach in order to be successful. This effort will include our international partners, as we learn from their work and perspectives, and share our own.

While we cannot afford to wait for absolute certainty about where and when impacts will occur, we must act based on the best available sound science even as we continue to incorporate new information as it becomes available. I challenge all of us to continue to strengthen our work with our many partners to recognize and respond to the effects of climate change on cultural resources. As stewards of America's greatest national treasures, we must draw on our strengths and join with our partners to meet this challenge over the long term.

appendix f: acknowledgments

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Funding

Preserving Coastal Heritage has been funded in part by a grant from the National Trust for Historic Preservation.

Special thanks to the National Park Service Northeast Region and Regional Director Michael Caldwell for hosting and supporting this event.

National Park Service
U.S. Department of the Interior

Preserving Coastal Heritage is a National Park Service initiative with support from the National Trust for Historic Preservation, the George Wright Society, and the National Endowment for the Arts.